Physics 101-Basic Physics

Catalog Description: Phys 101. Basic Physics. 3-3-0. Prerequisite: MATH or placement in MATH 165. A study of mechanics, heat, and sound; course designed for students not majoring in chemistry or physics. Credit toward graduation may be earned in this course or in PHYS 201 but not in both. Students enrolled in this course should schedule PHYS 103.

Prerequisite: MATH 102 or placement in MATH 165.

Recommended Text: "Essentials of Physics" by Serway & Vuille.

Class Materials: Documents discussed in class will periodically be placed on the Blackboard site for download. Exams from previous classes are on the professor's website (http://www.nicholls.edu/phsc/cyoung/EXAMS).

Student Outcome Objectives:

- PHYS 101, as a Core Curriculum course, fulfills three hours of general education requirements in the area of the natural sciences and is thus designed to enable students to meet the following broad outcomes for all the natural sciences:
  - Upon completion of the undergraduate curriculum, students will be able to comprehend and to apply the basic principles of science and methods of scientific inquiry.
  - Graduates will be able to comprehend and to use quantitative concepts and methods to interpret and to critically evaluate data and to effectively problem-solve in a variety of contexts demanding quantitative literacy.
  - Graduates will be able to comprehend and to apply the basic principles of science and methods of scientific inquiry.
  - For further explanation of the learning objectives associated with these goals, visit http://www.nicholls.edu/gened/goals_objectives.html.
- The student will demonstrate a conceptual and mathematical understanding of motion and vectors in 1 and 2 dimensions.
- The student will apply the concepts of energy and momentum (in 1 dimension) to problems involving one or more bodies in motion.
- The student will be able to mathematically and conceptually describe the behavior of bodies in rotational motion.
- The student will demonstrate knowledge of thermodynamics and its applications to gases, solids, and liquids.
- The student will demonstrate knowledge of vibrations and waves and apply this knowledge to the understanding of sound and its properties.

Course Content:

Chapters: 1 – Introduction, Measurement, Estimating
2 – Motion in 1 Dimension
3 – Vectors and 2-Dimensional Motion
4 – Laws of Motion
5 – Energy
6 – Momentum and Collisions
7 – Rotational Motion and the Law of Gravity
8 – Rotational Equilibrium and Dynamics
9 – Solids and Fluids
10 – Thermal Physics
11 – Energy in Thermal Processes
12 – The Laws of Thermodynamics
13 – Vibrations and Waves
14 – Sound

Testing: All examinations will be closed book. Data and constants will be provided. The following are the exam dates:

Exam #1: **Friday, 18 September 2009**
Exam #2: **Wednesday, 21 October 2009**
Exam #3: **Friday, 20 November 2009**
Final Exam: **Monday, 7 December 2009, 1 pm**

Homework: I will assign the homework at the beginning of each segment. I will not collect the homework, but you will have periodic and announced quizzes whose problems will be taken directly from the homework. Solutions for the homework can be found at: http://www.nicholls.edu/phsc/physics/homework

Quizzes: For each segment prior to the hour-exams, you will take 1 quiz. These quizzes will be announced one class before the quiz date. The problems on each quiz will come directly from the homework assignment.

Class Participation: Students will be able to receive a total of 20 points for class participation. These points will come from clicker questions, each of which is worth ¼ point for any answer and an additional ¼ point if the answer is correct. In case of classroom disturbances, 3 points will be deducted from the student's class participation credit. The class participation credit will not have a negative value.

Grading: There are a total of 500 points. Each hour exam counts 100 points, and the final exam is worth 150 points (450 points). Quiz grades combine to a total of 30 points. Class participation credit comprises 20 points. The grading scale is percentage-based with A (90-100%), B (80-89%), C (70-79%), D (60-69%), and F (0-59%) grades being assigned at the end of the semester.

For example, a student might receive these grades:

Hour exams: 85, 92, 73
Quiz grades: 10, 10, 4
Class participation: 18
Final Exam: 138
Extra Credit: 15
This student's final grade would be the total of these points divided by 500, or 89% (B).

Extra Credit: The student will have several opportunities for extra credit. The criteria for these credits are outlined in a separate document available on BlackBoard. A student can receive up to 20 extra credit points.